



2005 Minerals Yearbook

MOZAMBIQUE

THE MINERAL INDUSTRY OF MOZAMBIQUE

By Thomas R. Yager

In 2005, the mineral industry of Mozambique produced aluminum, gold, tantalum, and such industrial minerals as bauxite, beryl, brick clay, diatomite, gemstones, graphite, and salt and building materials that included cement, granite, gravel, limestone, marble, and sand. The country also produced coal and natural gas. Deposits of asbestos, bentonite, copper, feldspar, fluorspar, gypsum, iron ore, manganese, mica, nepheline syenite, perlite, phosphate rock, rare earths, silica sand, titanium, and zirconium have also been identified.

The International Monetary Fund (2006, p. 184) estimated that Mozambique's real gross domestic product (GDP) grew by 7.7% in 2005 compared with a revised 7.5% in 2004. In 2004, manufacturing accounted for 14% of the GDP; construction 9.6%; electricity and water, 1.9%; and mining, 1.8%. The nominal GDP based on purchasing power parity amounted to \$27 billion in 2005 (International Monetary Fund, 2005, p. 41; 2006¹).

The value of output in the mining sector increased by 216% in 2004 and 40% in 2005; most of the increase in 2004 was attributable to the commencement of the Temane natural gas project and increased tantalite production. In 2005, natural gas production continued to rise; bauxite, beryl, gold, and granite production also increased. These increases were partially offset by decreases in the output of coal, gemstones, tantalite, and such construction materials as brick clay, limestone, marble, and sand; bentonite and quartz mining was shut down (Government of Mozambique, 2005, p. 28; Organisation for Economic Cooperation and Development, 2006, p. 389).

Commodity Review

Metals

Aluminum.—Mozambique was Africa's second ranked producer of aluminum behind South Africa. The Mozal aluminum smelter, which used alumina imported from western Australia as raw material, increased output to 555,000 metric tons (t) in 2005 compared with 549,000 t in 2004 and 407,000 t in 2003 (table 1). Production increased in 2003 and 2004 because of the completion of the Mozal 2 project, which doubled Mozal's rated capacity to 506,000 metric tons per year (t/yr) (table 2; BHP Billiton Ltd., 2005a, p. 2; 2006, p. 2).

BHP Billiton Ltd. completed feasibility studies for the expansion of the Mozal smelter. The Mozal 3 project would increase the rated capacity of the smelter by an additional 250,000 t/yr by 2009. Final approval of the project was pending the outcome of negotiations on long-term power supply contracts (Hill, 2006).

Exports of aluminum rose to \$915 million in 2004 (the latest year for which data were available) compared with nearly

\$568 million in 2003. In 2004, aluminum accounted for 61% of Mozambique's total exports. From 2000 to 2004, aluminum accounted for 75% of the total growth in the country's exports (International Monetary Fund, 2005, p. 69).

E.C. Meikles (Pty.) Ltd. of Zimbabwe operated a small bauxite mine in Manica Province. In 2005, output was 9,518 t compared with 6,723 t in 2004 and 11,793 t in 2003. Exports amounted to 6,610 t in 2005 (Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

Gold.—Mozambique's gold resources were located in lode and placer deposits throughout the country; gold was produced by artisanal miners. Officially reported production of gold was 63 kilograms (kg) in 2005 compared with 56 kg in 2004. Reported gold output was expected to rise in 2006 because of increased efforts by the Government to support the marketing of artisanal gold production (Government of Mozambique, 2005, p. 28-29; Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

Artisanal gold miners in the Manica District produced gold at an estimated rate of 40 kilograms per month (kg/mo) to 50 kg/mo; mercury used during the production process was consumed at a similar rate. Most of this production was not sold to the Government because private buyers were more likely to be present at mine sites and were willing to provide free mercury in return for guaranteed gold sales. The Global Environment Facility, the United Nations Industrial Development Organization, and the United Nations Development Programme instituted a pilot project to assist miners in reducing mercury pollution problems (United Nations Industrial Development Organization, 2005, p. 15, 26).

Central African Mining and Exploration Company plc (CAMEC) explored for gold at its Muda River project in the Nhamatando District in Sofala Province. The company also held a license to purchase and export gold and silver, which it was using to encourage local artisanal production and to raise cash to finance its operations (Central African Mining and Exploration Company plc, 2005b).

Pan African Resources plc of the United Kingdom held a license for the Manica project. In October 2005, the company estimated that resources at Manica were 5.3 million metric tons (Mt) at a grade of 4.8 grams per metric ton gold (Pan African Resources plc, 2005).

Nickel.—African Eagle Resources plc held a prospecting license for the Muazua nickel project in northern Mozambique. The company carried out exploration at Muazua during the first half of 2005.

Tantalum.—National production of tantalite was 281,212 kg in 2005 compared with 712,095 kg in 2004 and 188,695 kg in 2003. Fleming Family & Partners owned a majority stake in the Marropino Mine through Highland African Mining Company (HAMC). In July 2004, HAMC was awarded a license to produce tantalite from the Morrua Mine, which had been

¹A reference that includes a section mark (§) is found in the Internet Reference Cited section.

shut down since the 1980s. Until August 2005, development of the mine was on hold because of legal concerns; Companhia Mineira de Morrúa, which was the previous owner of the mining rights for Morrúa, was unsuccessful in its lawsuit against the Government. If the Morrúa Mine were to be reopened, it could produce as much as 230,000 kilograms per year (kg/yr) of tantalum oxide (Ta₂O₅) (Richardson, 2005; Sunday Times, 2005; Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

CAMEC was producing at a rate of about 17,000 kg/yr of Ta₂O₅ in September 2004. The company engaged in an upgrade of its production facilities to raise production to 27,000 kg/yr of Ta₂O₅ by May 2005 and 54,000 kg/yr of Ta₂O₅ by December 2005. CAMEC held prospecting and exploration licenses for tantalum and associated minerals in the Alto Molocue, the Lugela, and the Mocuba Districts in Zambezia Province, and for tantalum and tin in the Nhamatando District in Sofala Province (Central African Mining and Exploration Company plc, 2004).

In September 2004, TAN Mining and Exploration of South Africa decided to proceed with the reopening of the Muiane Mine. The company planned to restart mining in mid-2005 at a cost of \$5 million. TAN planned to produce 82,000 kg/yr of Ta₂O₅ in concentrate from 420,000 t/yr of ore; the tantalite recovery rate would be about 60%. The expected life of the mine was 5 years (Mining Review Africa, 2005). Given the sharp decline in domestic tantalite production in 2005, it is unclear whether the Muiane Mine actually reopened.

Titanium and Zirconium.—The Corridor Sands Project was based upon 10 deposits of heavy-mineral sands near Chibuto in southern Mozambique. Starting in the third year of the project, WMC Resources Ltd. of Australia planned to produce 375,000 t/yr of titanium slag, 184,300 t/yr of high-purity pig iron, 21,500 t/yr of zircon, 5,100 t/yr of rutile, and 2,700 t/yr of leucoxene in the initial phase of the project. Production could eventually rise to 1 million metric tons per year (Mt/yr) of titanium slag, 491,100 t/yr of high-purity pig iron, 62,500 t/yr of zircon, 12,200 t/yr of rutile, and 6,400 t/yr of leucoxene. The initial phase of the project was expected to cost \$500 million. In 2005, WMC was purchased by BHP Billiton, which proceeded to conduct a review and updates of previous feasibility studies. BHP Billiton was also considering the development of the TiGen mineral sands project at Moebase (WMC Resources Ltd., 2003; BHP Billiton Ltd., 2005b, p. 76).

Kenmare Resources plc of Ireland continued construction of the Moma mineral sands mine in 2005. The company planned to start production during the second half of 2006 and to produce 701,000 t/yr of ilmenite, 60,000 t/yr of zircon, and 17,000 t/yr of rutile. Moma's projected lifetime was 20 years. Capital costs were expected to be \$348 million; annual revenues, \$85 million; and annual operating costs, \$23 million. Kenmare signed contracts for the purchase of 50% of the ilmenite production for the first 5 years of operation (Mining Journal, 2004; Kenmare Resources plc, 2005a, p. 4; b).

Industrial Minerals

Cement.—National cement consumption increased by about 6% to more than 700,000 t in 2005. Cimentos de Mocambique

SARL [Cimentos de Portugal, SGPS, SA (Cimpor), 65.4%] was the country's only cement producer prior to 2005. Cimpor operated plants at Dondo, Matola, and Nacala. The company was forced to import about 100,000 t of clinker in 2005 because of operational problems at the Matola plant. Cimpor started upgrades to the Nacala grinding plant and a feasibility study on restarting the clinker production line at Dondo (Cimentos de Portugal, SGPS, SA, 2006, p. 71-72).

In mid-2005, a new cement plant with a capacity of about 250,000 t/yr was completed in Nacala by ARJ Group at a cost of \$18 million. The new plant was expected to alleviate the shortage of cement in northern Mozambique. ARJ Group exported some of its output to Madagascar and Malawi and planned to sell to other countries in the region (Mozambique News Agency, 2005c).

Clay and Shale.—Mozambique had deposits of bentonite, brick clay, and kaolin. Brick clay production fell to 32,031 t in 2005 from 108,231 t in 2004 and 100,176 t in 2003. Cia Desenvolvimento Mineira ceased mining bentonite at Boane in southern Mozambique after resuming operations in 2004; production previously had been shut down by flooding. The company continued to produce small amounts of processed bentonite (Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

Gemstones.—The mine output of garnet was 2,172 kg in 2005 compared with 2,686 kg in 2004 and 440 kg in 2003; the production of aquamarine, dumortierite, and tourmaline also fell sharply. Sociedade Mineira de Cuamba E.E., which held the rights to the Cuamba garnet mine, was privatized in 2005; investments by the new owner were expected to result in higher garnet production in 2006. The production of dumortierite was likely to increase with the completion of access roads near the mines. The Government planned to increase monitoring of and technical assistance to small-scale producers of tourmaline in 2006 (Government of Mozambique, 2005, p. 28; Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

Stone, Dimension.—One of Mozambique's few large-scale marble quarries was located at Montepuez in Cabo Delgado Province. Marble from Montepuez was processed into finished products at a plant in Pemba, some of which were exported to Portugal. In 2005, the production of marble blocks fell by nearly 18%, and marble slabs, by 10%. Granite production, however, increased sharply in 2005 (Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

Mineral Fuels

Coal.—The production of coal has been limited in recent years because damage to the Sena rail line during the civil war in the 1980s cut off access from the Moatize coalfield to overseas markets. More recent declines in production may have been attributable to downtime caused by the rehabilitation and installation of new equipment at the Chipanga XI Mine. Output fell to 3,417 t in 2005 from 16,525 t in 2004 and 36,742 t in 2003. Exports of coal fell to 10,032 t in 2005 compared with 30,288 t in 2004; coal was exported to Malawi. In 2006, coal

production was expected to increase because of the completion of repairs at the Chipanga XI Mine and rising regional demand for coal (Government of Mozambique, 2005, p. 27; Fatima Momade, National Director, National Directorate of Mines, written commun., April 17, 2006).

Companhia Vale do Rio Doce (CVRD) of Brazil planned to complete a feasibility study on the development of the Moatize coalfield in June 2006. If the feasibility study yielded favorable results, CVRD planned to build a mine that would produce 14 Mt/yr of coal. Production was expected to start in 2009. The company also planned to build a coal-fired power station with a capacity of 1,500 megawatts (MW). Most of the production from the new mine would be coking coal for consumption by steel plants in Brazil; the remainder was expected to be thermal coal for domestic consumption and export to African markets. Development of the Moatize Mine would also require rehabilitation of the railway from Beira to Tete, and the construction of a maritime export terminal at Beira. Total costs of the project were expected to be \$1 billion (Mozambique News Agency, 2004; Metal Bulletin, 2005).

In August 2005, the Government awarded 10 coal exploration licenses to CAMEC. The company planned to focus initially upon its licenses in the Moatize coalfield, which had estimated resources of 2.4 billion metric tons (Gt) of coal. CAMEC also planned to explore at its licenses in the Mucanha coalfield, which had estimated resources of 3.6 Gt (Central African Mining and Exploration Company plc, 2005a).

Natural Gas.—Mozambique's production of natural gas rose to 2.31 billion cubic meters in 2005 from nearly 1.3 billion cubic meters in 2004 and 1 million cubic meters in 2003 because of the development of the Temane Gas Project. Sasol Ltd. of South Africa, which operated the project, exported gas from Temane through an 865-kilometer (km) pipeline to supply its South African chemical plants. The Mozal smelter and other Mozambican industrial establishments were expected to purchase gas from Temane and Pande in the future. Sasol planned to increase production to 3.1 billion cubic meters per year by 2008 (Sasol Ltd., 2004).

In June 2005, Sasol was awarded licenses to explore Blocks 16 and 19 for natural gas and petroleum. These blocks were located offshore to the east of the Pande and the Temane gasfields. The licenses were valid for 8 years, with a 25-year extension available depending upon the exploration results. Sasol planned to spend \$7 million during the first phase of exploration (Mozambique News Agency, 2005a).

Petroleum.—Mozambique produced neither crude petroleum nor refined petroleum products and relied on imports. In March 2005, PetroSA of South Africa decided not to pursue a joint-venture agreement with Det Norske Olje-Selskap of Norway to explore for petroleum in the Inhaminga onshore block north of Beira. Petronas of Malaysia held an offshore exploration block near the Zambezi Delta.

Uranium.—The Mavuzi Mine in northwestern Mozambique produced uranium during the 1950s. In late 2005, OmegaCorp Ltd. of Australia resumed exploration at Mavuzi; further exploration was expected in 2006.

Infrastructure

Hydroelectrica Cahora Bassa (HCB) [the Government of Portugal, 82%, and the Government of Mozambique, 18%] produced most of Mozambique's electricity. The company operated the Cahora Bassa hydroelectric plant, which had a capacity of 2,075 MW. In November, the Governments of Mozambique and Portugal signed a memorandum of understanding to increase the share of the Mozambican Government in HCB to 85% and reduce the share of the Portuguese Government to 15%. Under the agreement, the Portuguese Government would receive \$950 million (Mozambique News Agency, 2006; Organization for Economic Cooperation and Development, 2006, p. 395).

The Mozal smelter consumed 900 MW of capacity; an additional 500 MW was likely to be consumed if the Mozal 3 project proceeds. All district capitals were expected to be connected to the national power grid by 2010. Hydropower projects proposed to meet future demand for electricity included Mepanda Ncuca, with a capacity of 1,300 MW; Cahora Bassa, 850 MW; Lupata, 650 MW; and Boroma, 150 MW. The Moatize coal-fired power station would have a capacity of 1,500 MW (Hill, 2006; Mozambique News Agency, 2006).

Iron International of India and Rites Ltd. of India were engaged in rebuilding the 650-km rail line from Beira to Tete, which linked the Moatize Mine to the Port of Beira. Rehabilitation was expected to be completed in early 2009. The rail line has been inoperable since 1984 because of civil unrest and a lack of funds for rehabilitation; the World Bank agreed to provide \$130 million in funding (Mozambique News Agency, 2005b).

Spoornet of South Africa, which was a state-owned company, held the lease to the rail line from Maputo to Ressa Garcia on the border with South Africa. In 2005, the Government of Mozambique canceled the lease because Spoornet had not invested \$10 million to rehabilitate the rail line. The lease was subsequently awarded to state-owned Portos e Caminhos de Ferro de Moçambique (CFM); the company planned to rehabilitate the rail line in 2006 (Organization for Economic Cooperation and Development, 2006, p. 396).

Outlook

The International Monetary Fund (2006, p. 184) predicted that Mozambique's GDP would increase by 7.9% in 2006 and 7% in 2007. The Moma Mine was likely to increase economic growth in 2006 and 2007; the outlook for titanium minerals in Mozambique depended heavily upon global market trends. The Moatize Mine could boost economic growth in 2009; the development of the mine depended upon global market trends and the rehabilitation of rail and port infrastructure. Development of the Corridor Sands and the Mozal 3 projects depended upon reliable power supplies. Demand for construction materials could increase in 2006 because of road and bridge rehabilitation; the development of the Corridor Sands, Moatize, and Mozal 3 projects could also lead to growth in the construction sector.

References Cited

- BHP Billiton Ltd., 2005a, BHP Billiton production report for the quarter ended 31 December 2004: Melbourne, Australia, BHP Billiton Ltd. press release, January 27, 13 p.
- BHP Billiton Ltd., 2005b, Form 20-F: Melbourne, Australia, BHP Billiton Ltd., 327 p.
- BHP Billiton Ltd., 2006, BHP Billiton production report for the quarter ended 31 December 2005: Melbourne, Australia, BHP Billiton Ltd. press release, January 24, 14 p.
- Central African Mining and Exploration Company plc, 2004, Interim results for the six months ended 30 September 2004: London, United Kingdom, Central African Mining and Exploration Company plc press release, December 29, 13 p.
- Central African Mining and Exploration Company plc, 2005a, CAMEC expands into coal in Mozambique: London, United Kingdom, Central African Mining and Exploration Company plc press release, August 15, 2 p.
- Central African Mining and Exploration Company plc, 2005b, Final results for the year ended 31 March 2005: London, United Kingdom, Central African Mining and Exploration Company plc press release, September 29, 7 p.
- Cimentos de Portugal, SGPS, SA, 2006, Annual report 2005: Lisbon, Portugal, Cimentos de Portugal, SGPS, SA, 191 p.
- Government of Mozambique, 2005, Plano económico e social para 2006: Maputo, Mozambique, Government of Mozambique, 127 p.
- Hill, Liezel, 2006, Tough talks on Mozal power supply: Australia's Paydirt, v. 1, no. 124, December 2005/January 2006, p. 46.
- International Monetary Fund, 2005, Republic of Mozambique—Selected issues and statistical appendix: Washington, DC, International Monetary Fund, September 6, 72 p.
- International Monetary Fund, 2006, World economic outlook—Globalization and external imbalances: Washington, DC, International Monetary Fund, April, 266 p.
- Kenmare Resources plc, 2005a, Annual report and accounts 2004: Dublin, Ireland, Kenmare Resources plc, 44 p.
- Kenmare Resources plc, 2005b, First natural gas from Mozambique arrives in Secunda: Dublin, Ireland, Kenmare Resources plc press release, February 23, 1 p.
- Metal Bulletin, 2005, Mozambique opts to award 10 coal exploration licenses to CAMEC: Metal Bulletin, no. 8907, August 22, p. 20.
- Mining Journal, 2004, Kenmare arranges Moma financing: Mining Journal, June 25, p. 13.
- Mining Review Africa, 2005, TAN and the Muiane project: Mining Review Africa, no. 1, p. 28.
- Mozambique News Agency, 2004, Brazilian mining giant wins Moatize tender: Mozambique News Agency press release, November 25, 2 p.
- Mozambique News Agency, 2005a, Contract for offshore gas prospecting signed: Mozambique News Agency press release, June 6, 1 p.
- Mozambique News Agency, 2005b, Money for Sena line now available: Mozambique News Agency press release, June 20, 1 p.
- Mozambique News Agency, 2005c, President inaugurates cement factory: Mozambique News Agency press release, July 18, 1 p.
- Mozambique News Agency, 2006, Electricity deficit must be solved: Mozambique News Agency press release, May 2, 2 p.
- Organisation for Economic Cooperation and Development, 2006, Mozambique, in African Economic Outlook 2005-2006: Paris, France, Organisation for Economic Cooperation and Development, p. 385-400.
- Pan African Resources plc, 2005, Resource upgrade—Manica project in Mozambique: London, United Kingdom, Pan African Resources plc press release, October 13, 2 p.
- Richardson, Paul, 2005, Mozambique fights coltan issue: Sunday Times [Johannesburg, South Africa], August 12, 1 p.
- Sasol Ltd., 2004, First natural gas from Mozambique arrives in Secunda: Rosebank, South Africa, Sasol Ltd. press release, February 23, 2 p.
- Sunday Times, 2005, Tantalising prospects: Sunday Times [Johannesburg, South Africa], June 19, 2 p.
- United Nations Industrial Development Organization, 2005, Pilot project for the reduction of mercury contamination resulting from artisanal gold mining fields in the Manica District of Mozambique: Vienna, Austria, United Nations Industrial Development Organization, 43 p.
- WMC Resources Ltd., 2003, Corridor Sands: Southbank, Australia, WMC Resources Ltd., brochure, January, 9 p.

Internet Reference Cited

- International Monetary Fund, 2006 (April), Mozambique, World Economic Outlook Database, accessed June 13, 2006, via URL <http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm>.

TABLE 1
MOZAMBIQUE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
Aluminum:						
Bauxite		8,592	9,119	11,793	6,723	9,518
Metal, refined		266,000	273,000	407,000	549,000	555,000
Beryl	kilograms	800	54,300	78,300	45,200	146,300
Cement, hydraulic	thousand metric tons	265	285	362	370 ^{r, e}	400 ^e
Clays:						
Bentonite:						
Crude		1,357	--	--	3,336	--
Processed		254	580	684	578	547
Brick		63,125	84,024	100,176	108,231	32,031
Coal, bituminous		27,600	43,512	36,742	16,525	3,417
Columbium (niobium) and tantalum, columbite-tantalite, ore and concentrate:						
Gross weight	kilograms	27,000	46,900	188,695	712,095	281,212
Nb content ^c	do.	3,300	5,500	23,000	87,000	34,000
Ta content ^c	do.	7,700	13,000	54,000	205,000	81,000
Diatomite		--	--	--	3,000 ^e	4,500 ^e
Gemstones:						
Aquamarine	kilograms	47	26	8	18	16
Dumortierite		50	40	65	113	10
Garnet	kilograms	--	1,136	440	2,686	2,172
Tourmaline	do.	18	124	581	1,570	245
Gold ²	do.	22	17	63	56	63
Natural gas	million cubic meters	1	2	1	1,295	2,316
Quartz	kilograms	24,765	31,363	30,985	173,478	--
Salt, marine ^c		10,000	80,000	80,000	80,000	80,000
Sands	cubic meters	464,684	795,813	1,372,032	1,429,743	833,113
Stone:						
Granite	do.	662	670	539	521	2,198
Gravel and crushed rock	do.	503,716	795,733	800,000 ^e	800,000 ^e	800,000 ^e
Limestone		729,230	1,301,232	1,348,372	1,593,450	654,179
Marble:						
Block	cubic meters	320	453	452	617	509
Slab	square meters	15,303	9,980	10,227	13,666	12,318

^eEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. -- Zero.

¹Data available through June 13, 2006.

²Does not include unreported production; total output of gold was estimated to be roughly 600 to 900 kilograms per year.

TABLE 2
MOZAMBIQUE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity ¹
Aluminum		Mozal SARL (BHP Billiton Ltd., 47.11%)	Maputo	506,000.
Bauxite		E.C. Meikles (Pty) Ltd. of Zimbabwe	Monte Snuta	12,000. ^c
Bentonite		Cia Desenvolvimento Mineira ²	Boane	17,000. ^c
Cement		Cimentos de Mocambique, SARL (Cimentos de Portugal, SGPS, SA (Cimpor), 65.4%)	Dondo, Matola, and Nacala	730,000.
Do.		ARJ Group	Nacala	250,000.
Coal, bituminous		Carbomoc	Chipanga XI Mine at Moatize	60,000.
Columbium (niobium) and tantalum, columbite-tantalite, ore and concentrate	kilograms	Fleming Family & Partners	Marropino	315,000 ^c concentrate; 110,000 Ta ₂ O ₅ ; 47,000 Nb ₂ O ₅ . ^c
Do.	do.	Central African Mining and Exploration Company plc (CAMEC)	Zambezia Province	155,000 concentrate; 54,000 Ta ₂ O ₅ .
Do.	do.	Hegemony Resources	Naquissupa	NA.
Gold	do.	Artisanal Miners	Manica District	600.
Garnet	do.	Sociedade Mineira de Cuamba EE	Cuamba	4,400. ^c
Graphite		Kenmare Resources plc ³	Ancuabe	10,000.
Marble, block	cubic meters	Marmonte E.E.	Montepuez	1,500.
Natural gas	million cubic meters	Sasol Ltd. (50%)	Temane	3,100.

^cEstimated; estimated data are rounded to no more than three significant digits. NA Not available.

¹Abbreviations used in this table for commodities include the following: Nb₂O₅--columbium (niobium) oxide; and Ta₂O₅--tantalum oxide.

²Not operating in 2005.

³On care and maintenance since 1999.

TABLE 3
MOZAMBIQUE: MINERAL RESOURCES IN 2005¹

Commodity	Deposit	Tonnage	Grade	Mineral content
Bentonite	Boane	7.1 Mt	NA	NA.
Beryllium	Monea, Morrua, and Muiane	NA	NA	3,100 t BeO.
Coal	Minjova	7,100 Mt	NA	NA.
Do.	Mucanha-Vuzi	3,600 Mt	NA	NA.
Do.	Moatize	2,400 Mt	NA	NA.
Do.	Maniamba	230 Mt	NA	NA.
Columbium (niobium) and tantalum	Marropino	22 Mt	108 g/t Nb ₂ O ₅ ; 254 g/t Ta ₂ O ₅	2,400 t Nb ₂ O ₅ ; 5,600 t Ta ₂ O ₅ .
Do.	Morrua	7.5 Mt	88 g/t Nb ₂ O ₅ ; 661 g/t Ta ₂ O ₅	660 t Nb ₂ O ₅ ; 5,000 t Ta ₂ O ₅ .
Do.	Muiane	2 Mt	320 g/t Ta ₂ O ₅	640 t Ta ₂ O ₅ .
Gold:				
Placer	Chimezi, Inhamurra, Muza, and Revue Rivers	110 million cubic meters	0.25 grams per cubic meter	28 t Au.
Lode	Chimezi, Chua, Mangota, and Penhalonga/Revue	3.5 Mt	6.7 g/t Au	23 t Au.
Do.	Manica	5.3 Mt	4.8 g/t Au	25 t Au.
Graphite	Cabo Delgado Province	33 Mt	15% graphite	5 Mt graphite.
Do.	Satemua	5.6 Mt	6.3% graphite	350,000 t graphite.
Natural gas	Pande and Temane	130 billion cubic meters	NA	NA.
Titanium and zirconium				
Do.	Corridor Sands: West Block	1,800 Mt	4.14% ilmenite; 0.02% rutile; 0.15% zircon	73 Mt ilmenite; 350,000 t rutile; 2.6 Mt zircon.
Do.	East Block	910 Mt	3.8% ilmenite	34.5 Mt ilmenite.
Do.	Other areas	14,000 Mt	NA	NA.
Do.	Moma	2,370 Mt	3% ilmenite; 0.08% rutile; 0.25% zircon	72 Mt ilmenite; 2 Mt rutile; 6 Mt zircon.

NA Not available.

¹Abbreviations used in this table for commodities include the following: Au--gold; BeO--beryllium oxide; Nb₂O₅--columbium (niobium) oxide; and Ta₂O₅--tantalum oxide. Abbreviations used in this table for units of measurement include the following: g/t--grams per metric ton; Mt--million metric tons; and t--metric tons.

Sources: Afonso, R.S., and Marques, J.M., 1998, Recursos minerais da Republica de Mocambique [Mineral resources of the Republic of Mozambique]:

Maputo, Mozambique, Direccao Nacionalde Geologica, 150 p.

Companhia Vale do Rio Doce, 2004, CVRD wins concession to explore coal in Mozambique: Rio De Janeiro, Brazil, Companhia Vale do Rio Doce, November 12, 1 p.

Kenmare Resources plc, 2005, Annual reportand accounts 2004: Dublin, Ireland, Kenmare Resources plc, 44 p.

Mining Review Africa, 2005, TAN and the Muiane project: Mining Review Africa, no. 1, p. 28.

Pan African Resources plc, 2005, Resource upgrade—Manica project in Mozambique: London, United Kingdom, Pan African Resources plc press release, October 13, 2 p.

Radler, Marilyn, 2003, Worldwide reserves grow; oil production climbs in 2003: Oil & Gas Journal, v. 101, no. 49, December 22, p. 43-47.

Ruffini, Antonio, 1998a, Mozambican focus on heavy minerals, coal: African Mining, v. 3, no. 1, January-February, p. 45-46, 52.

Ruffini, Antonio, 1998b, Rehabilitating Mozambique's coal sector: African Mining, v. 3, no. 1, January-February, p. 47-48.

WMC Resources Ltd., 2003, Corridor Sands: Southbank, Australia, WMC Resources Ltd., brochure, January, 9 p.